

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY

STANDARDS
GOVERNING THE FORM AND ARRANGEMENT OF
PLANS, SPECIFICATIONS, AND ESTIMATES
FOR FEDERAL AID PROJECTS

AS PROVIDED FOR IN THE RULES AND REGULATIONS OF THE SECRETARY OF
AGRICULTURE FOR CARRYING OUT THE FEDERAL AID ROAD ACT

(EXCEPT SECTION 8 THEREOF)

ISSUED APRIL 28, 1917



WASHINGTON
GOVERNMENT PRINTING OFFICE
1917

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UNITED STATES DEPARTMENT OF AGRICULTURE.
OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING.

APRIL 5, 1917.

MEMORANDUM FOR THE DIRECTOR.

I inclose herewith draft of standards governing the form and arrangement of plans, specifications, and estimates for Federal aid projects, provided for in Regulation 5, section 8, of the Rules and Regulations of the Secretary of Agriculture for carrying out the Federal Aid Road Act (except section 8 thereof), promulgated September 1, 1916, and Amendment No. 2 of January 24, 1917, with the recommendation that they be promulgated in accordance with Amendment No. 2 to the Rules and Regulations.

These standards have been prepared in cooperation with the Committee of the American Association of State Highway Officials, appointed by the association for that purpose, and consisting of Messrs. W. D. Uhler, chief engineer Pennsylvania State highway department, chairman; A. W. Dean, chief engineer, Massachusetts Highway Commission; and W. W. Marr, chief engineer, Illinois State Highway Department.

Respectfully,

P. ST. J. WILSON,
Chief Engineer.

APRIL 5, 1917.

MEMORANDUM FOR THE SECRETARY.

I herewith submit draft of standards governing the form and arrangement of plans, specifications, and estimates to be used for all Federal aid projects, for which project statements are submitted after March 31, 1917, as provided in Regulation 5, section 8 of the Rules and Regulations issued by you September 1, 1916, and amended January 24, 1917, with the recommendation that they be promulgated by you in accordance with that section.

Respectfully,

L. W. PAGE, *Director.*

DEPARTMENT OF AGRICULTURE,
Washington, April 28, 1917.

In accordance with Regulation 5, section 8, of the Rules and Regulations for carrying out the Federal Aid Road Act (except section 8 thereof), promulgated September 1, 1916, and amended January 24, 1917, and April 23, 1917, I hereby prescribe and promulgate the following standards governing the form and arrangement of plans, specifications and estimates for all Federal aid projects for which statements are submitted after September 30, 1917.

D. F. HOUSTON,
Secretary of Agriculture.

**STANDARDS GOVERNING THE FORM AND ARRANGEMENT OF PLANS,
SPECIFICATIONS, AND ESTIMATES FOR FEDERAL AID PROJECTS
AS PROVIDED FOR IN REGULATION 5, SECTION 8, OF THE RULES
AND REGULATIONS OF THE SECRETARY OF AGRICULTURE FOR
CARRYING OUT THE FEDERAL AID ROAD ACT (EXCEPT SECTION 8
THEREOF), PROMULGATED SEPTEMBER 1, 1916, AND AMENDED
JANUARY 24, 1917, AND APRIL 23, 1917.**

PLANS.

The plans will consist of a title-page, typical cross section of improvement, plan and profile, cross sections, and such structural plans and State structural standards as may be necessary to properly show the proposed construction.

GENERAL.

SIZES.

All plans or drawings will be on flat sheets 22 by 36 inches outside dimensions. Border lines are to be so placed as to provide a binding margin 2 inches wide at the left-hand end and a margin one-half inch wide on the remaining three edges of all plans. On cross-section sheets the border lines may be omitted, but sufficient space should be allowed for the 2-inch binding edge at the left-hand end of the sheets. State highway department standard sheets, showing structural standards, may be made a part of the plans and be attached thereto, provided the size of these standard sheets does not exceed the size required for plans.

NOTATIONS.

The plans are to be based upon suitable surveys, and all notation necessary to make the required details clear is to appear appropriately throughout the plans.

Any information which the State highway departments may deem necessary for their own uses may be incorporated in the plans, in addition to that herein prescribed, provided it does not interfere with their legibility.

SUBMISSION.

The sheets composing the set of plans should be bound in the following order: Title-page, typical cross-section of improvement, road plans, State standards, special structural plans, and cross sections.

Blue prints of all plans, with the exception of cross sections, are to be submitted in triplicate, one copy of which will be returned when approved. Blue prints of cross-sections are to be submitted in duplicate. The necessary additional copies of bridge plans are to be submitted upon request of the Office of Public Roads after plans are approved. Each copy of a set of plans should be accompanied by a copy of the specifications.

TITLE-PAGE.

The title-page for the set of plans shall show, conveniently arranged, the title, scales, a layout map, an index of the drawings, a key to the conventional signs used, the number of the project in the upper right-hand corner, and, in the lower right-hand corner, a sufficient number of blank spaces for the dates and signatures of the approving State officials, and blank spaces for the dates and signatures of two approving Federal officials with their titles.

The layout map shall show the layout of the project, indicating county and State lines where contiguous to the road, north point, principal connecting and adjacent roads, principal streams, railroads, cities, and towns, and shall be of such scale as to permit its being shown on the title-page.

TYPICAL CROSS-SECTION OF IMPROVEMENT.

A typical cross-section of the improvement shall be placed on the first sheet directly following the title-page. This section, on a suitable scale, should show the various slopes for cut and fill, the width of graded section in cut and on embankment, the crown or shape of the finished surface, shoulders, gutters, etc., between slopes, the width and thickness of the various courses of pavement or surfacing, and the position of the profile grade line relative to the typical cross section, together with any desired additional details.

When more than one typical cross section is used, the proposed location for each should be indicated.

On this sheet also may be shown, if desired, any special information, such as summary of quantities, etc.

ROAD PLANS.**ARRANGEMENT.**

The plan and profile shall be placed on the same sheet. The plan shall be shown across the top of the sheet and the corresponding profile directly below. When the conditions permit, without interference or overlapping, two sections of the plan and profile may be shown on the same sheet.

A suitable standard profile ruling may appear across the lower portion of the sheet if desired, but the upper portion showing the plan should in no case bear profile ruling.

SCALES.

The plan shall be drafted to a scale of 1 inch = 100 feet, or 1 inch = 50 feet, at the option of the State highway department, and the profile shall be drafted to the same scale horizontally as the plan and to a scale of 1 inch = 10 feet vertically.

DATA ON PLAN.

The plan of the road shall show the center line of construction, bearing of tangents, right-of-way lines, stations of beginning and ending of curves, length of curves, approximate radii of curvature, station points, equations of stationing, streams, and railroads on or near the right of way, poles for wire lines, obstructions on the right of way, structures affected by the proposed construction, the location of proposed new culverts and bridges with their sizes, any old road surfaces or portions of pavements to be used in place in connection with the proposed construction, and all unusual or special features which can be anticipated, such as guardrail, retaining walls, ditch protection, and subdrains. Such of these items as lend themselves readily to location by descrip-

tion may be tabulated or noted, but the tabulation or notation should appear on each sheet of the plan concerned. In minor changes of location requiring new or additional right of way, the margins of the old roadway shall be shown by light broken lines.

The plan should be platted with the stationing from left to right. A north point should be placed on each sheet. All curve points and angles on the construction line should be marked by small circles and the 100-foot station points by a very short line drawn at right angles to the center line.

DATA ON PROFILE.

The profile is to show surface line, grade line, length of vertical curves, percentage of gradient, datum line, station ordinate lines, surface elevations and grade elevations at station ordinates, and changes of gradient. The surface line of stream beds under existing bridges, as well as that of the bridge floors, should be shown.

The "grade line" shall represent the profile of the surface of the finished pavement or surfacing along the center line of the proposed construction.

The "surface line" shall represent a profile of the surface of the ground along the center of the present traveled way where the new location of the roadway is to be essentially the same as the old location, although the centers may deviate slightly. Where relocations or realignments are made which will cause the center line of the new roadbed to be essentially different from the center of the present traveled way, the surface line shall represent a profile of the ground along the center of the proposed roadway. The surface line is to be drawn as a series of straight lines.

CROSS-SECTIONS.

Cross-sections taken at intervals not exceeding 100 feet shall be plotted to a scale of 1 inch = 5 feet, vertically and horizontally. They should be plotted from the bottom of the sheet upward and so as not to interfere unduly with one another. As these sheets are to be bound on the left-hand end, either the lower side or the right-hand end of the sheets may be used as the bottom in plotting. The sections should show the ground surface and the templet lines for the proposed construction. Each section should be marked with its station location and "grade-line" elevation. Any desired additional information such as area, yardage between sections, etc., may be shown.

STRUCTURAL PLANS.

Structural plans shall be submitted as indicated under the following conditions:

(1) For culverts or drainage structures with clear spans not exceeding 20 feet, measured along the center line of roadway, there shall be submitted either complete detail plans or standard plans giving all essential information. If standard plans are used, they should be bound with the plans for each project and not used by reference only.

(2) For bridges with spans exceeding 20 feet, the complete set of plans shall contain the following: Plan of bridge site, profile of crossing, cross-sections, complete stresses, design and general details, shop and all minor details, and such other drawings as may be essential to make the information complete and intelligible. While it is expected that plans will be submitted and approved and project agreements executed before bids are requested, the following exceptions will be allowed:

(a) Shop and minor details may be submitted after the contract is awarded but before work is begun on materials.

(b) When it is impracticable, as sometimes occurs in the case of movable spans, to submit plans and specifications previous to receiving bids, such plans and specifications may be submitted after bids are received, provided the State highway department shall notify the Office of Public Roads in advance as to all the steps to be followed in securing such bids, in the same manner as if the project agreement had been previously signed.

(3) For bridges requiring the approval of the Secretary of War, data required by him should, if practicable, be submitted for approval prior to its submission to the War Department. The remaining plans should be submitted as herein called for after authority has been granted by the Secretary of War.

When designs for culverts and bridges are submitted, they should be accompanied by three sets of specifications.

SPECIFICATIONS.

At the time plans are submitted they shall be accompanied by three copies of the specifications, proposal, and any necessary papers pertaining thereto, printed on paper 8½ by 11 inches in size, bound along the left-hand side.

Specifications shall be arranged in accordance with the instructions and outline following:

General headings, conforming to those in bold-faced type, are to be used in the order and form in which they appear in this outline. Under each of the general headings the subject matter in the order indicated is to be covered in separate paragraphs with suitable subheadings. It is not required that all subjects suggested in light-faced type be covered, nor is it required that all general headings indicated under "Construction details" be used in the specifications, but such subjects and general headings as are used should appear in the order indicated.

When desired, additional subjects under any of the required general headings should be placed with proper subheadings following those suggested, and in the "Construction details" additional general subjects with suitable general headings should be placed following or in place of "Miscellaneous items."

The specifications, proposal, contract, and bond, prepared as indicated herein, shall be assembled and bound together for submission, but may be made up from separate sheets, sections, or pamphlets. In any case the outline indicated under each separate part should be followed, and the parts assembled in the order given. If desired, a separate specification for all materials may be prepared, and references to such material details may be made in the construction details under "Materials"; in which case, the "Material details" should be placed immediately following the "Construction details," as indicated herein.

The outline for specifications, etc., follows.

**TITLE-PAGE OR COVER FOR SPECIFICATIONS,
ETC.**

(NOTE.—The name of the State should appear at top of the title-page in bold-faced caps.)

NOTICE TO CONTRACTORS.

Time and place of receiving and opening proposals.

Brief description of proposed work.

Place where plans and specifications may be examined or secured, and from whom information may be obtained.

Rights reserved to reject any or all proposals.

Any additional information desired.

NOTE.—The above information should be shown in the advertisement for proposals, and on the “Notice to contractors,” which may be sent out to prospective bidders. It may be attached to the proposal if desired, should the proposal be a separate form, or may be attached to or bound with the specifications, immediately following the title-page, if the specifications, proposal, and contract are one volume.

SPECIFICATIONS.

DEFINITION OF TERMS.

Definition of State, State highway department or commission, engineer, contractor, etc.

INSTRUCTIONS TO BIDDERS.

Interpretation of approximate estimate.

Statement regarding right of engineer to increase or decrease quantities shown in proposal.

Bidders required to examine the plans, specifications, special provisions, etc., and also the site of the proposed work.

Bidders' attention called to necessity of being familiar with Federal, State, and local laws affecting the work.

Explanation of use of, or contents of, proposal form.

Instructions for filling in proposal form.

Requirements regarding signatures on proposals.

Prohibition of alteration, erasures, etc., on proposal forms.

Bidders' guaranty to accompany proposals.

Reference to form of guaranty required—Certified check, to whom payable, and amount indicated in proposal or percentage of contract required; or, proposal bond, form, amount indicated in proposal, and how executed.

Instructions for submitting or delivering proposals.

Delivery by mail and delivery in person.

Statement that proposals may or may not be withdrawn.

In case withdrawal is allowed, the bidder should be obliged to file his written request not later than the day previous to the opening of the proposals.

Opening of proposals.

Time and place and invitation to bidders to be present.

Disqualification of bidders.

No right to submit more than one proposal; collusion; unbalanced proposals; failure to carry out previous contracts; and lack of experience and capital.

Any additional clauses desired.

AWARD AND EXECUTION OF CONTRACT.

Right reserved to reject any and all proposals and to waive technicalities.

Award of contract.

By whom, place, to whom, and when made.

Return of proposal guaranty.

How and when returned.

Contract bond required.

Reference to form furnished by State and to the amount shown in proposal or percentage of amount of contract required.

Execution of contract.

Time and place.

Failure to execute contract.

Restrictions relative to subletting or assigning contracts.

Statement relative to use of patented processes, materials, or methods.

GENERAL PROVISIONS.

Scope of work to be done.

General statement relative to performing work and furnishing labor, equipment, etc., except as provided in the "Special provisions." in accordance with the plans, specifications, and contract.

Necessary State and local permits and licenses to be secured by contractor.

No deviation from plans, specifications, etc., by contractor.

Interpretation of plans, etc.

Figured dimensions to govern.

Special work.

Clause calling attention to special provisions for work or special requirements, not covered by the standard specifications, designating in this clause whether the special provisions will be found in the specifications, or will be attached to or bound with the proposal.

Alteration of work.

Clause regarding right of engineer to alter plans or character of work within reasonable limits.

Additional work.

Provision referring to additional work due to increase of quantities which is to be paid for at contract unit prices.

Extra work or force account.

Clause pertaining to work for which no price is named in the proposal and which is to be paid for at a price to be agreed upon or on a percentage basis, at prices to be agreed upon for labor, rentals, materials, etc. It should be specifically shown to which items the percentage applies.

Unauthorized work.

No payment made therefor.

Prosecution or progress of the work.

Limitation of operations.

Character of workmen and equipment.

Cooperation of contractor required.

Clause requiring contractor to have copy of plans, specifications, etc., and authorized representative to receive and obey orders of engineer on the work at all times.

Laws to be observed.

Sanitary provisions.

Observance of rules of boards of health.

Public convenience and safety.

Traffic regulations, nonobstruction of sidewalks, fire hydrants, etc., use of barricades, danger, warning and detour signs, precautions in the use of explosives.

Preservation and restoration of public utilities, property, trees, monuments, etc.

To be preserved and restored and made good if damaged or injured.

Contractor's responsibility for damage to persons and property.

Contractor's responsibility for damage to work.

Contractor's responsibility for sections or portions of roadway opened to traffic prior to final approval or acceptance.

Contractor required to restore surfaces opened by permit and basis of payment therefor, also provision for failure to restore surface openings.

Tests of samples of materials.

Statement of where and by whom tests will be made.

Quality of materials.

Statement that materials shall maintain qualities equal to the requirements of the specifications, or to approved samples.

Storage of materials.

Use of materials found on work.

Statement relative to use of any stone, gravel, sand, etc., found in excavation.

Disposal of materials, structures, etc., found on work and not used in the construction.

Lines, grades, and measurements.

To be given by engineer, and stakes and markings to be preserved by contractor.

Crown or cross-section of roadway.

To be as shown on typical cross-section and only changed where drainage or other conditions make it necessary.

Authority and duties of assistants, inspectors, etc., and the limitations of such authority and duty.

Engineer as referee in case of disputes.

Inspection of materials and work.

Defective materials and work.

Clause as to disposition thereof.

Failure to remove or renew defective materials or work.

Final cleaning up.

Clause covering removal of temporary structures and excess material and condition in which the roadway shall be left upon completion.

Suspension of work.

Authority for, reasons—fault of contractor, bad weather, etc.

Method of computing the time allowance for completing the work.

Failure to complete work on time.

Liquidated damages to be collected.

Annulment of contract.

Conditions under which contract may be annulled and procedure thereof.

Measurement of quantities.

Scope of payments.

Statement that payments made for all work done shall be full compensation for such work, including all claims of any character, and such payments do not constitute acceptance of the work.

Partial payments.

Method of payment.

Approval and final payment or acceptance and final payment.

No waiver of legal rights.

Statement regarding right of State to show true character of estimates should error be discovered, etc.

Any additional clauses desired.

CONSTRUCTION DETAILS.

EXCAVATION AND EMBANKMENT.

Description of work included under excavation, such as clearing and grubbing, excavation of roadway, driveways, intersections, ditches, etc., and the making of embankments.

Clearing and grubbing.

Specific requirements.

Removal of structures, obstructions, etc.

Specific requirements.

Roadway excavation.

Specific requirements.

Excavation for structures.

Specific requirements, including back filling.

Embankment.

Specific requirements.

Disposal of surplus material.

Specific requirements.

Borrow excavation.

Specific requirements.

Overhaul of excavation.

Specific requirements.

Subgrade.

Specific requirements, including preparation, removal, and replacing of defective material, protection, and acceptance.

Shoulders.

Specific requirements.

Method of determining excavation quantities.

A statement of how quantities shall be measured.

Basis of payment.

Statement relative to compensation for excavation and its various subdivisions, and whether compensation is made collectively or separately.

NOTE.—When several similar types of constructions are set forth in the same set of specifications, such as several kinds of pipe culverts or pavements, each should be covered separately in accordance with the outlines indicated in the following.

SUBBASE.

Any broken stone, gravel, or other material used to replace unsuitable subgrade material or to support the base course.

Description.

Materials.

Construction methods.

Basis of payment.

BASE COURSES OR FOUNDATIONS FOR PAVEMENTS.

..... BASE COURSE.

Insert name

Description.

Materials.

Stone, sand, screenings, etc.

Construction methods.

Placing, rolling, etc.

Basis of payment.

Repeat the same outline for each kind of base course.

SURFACE COURSES OR PAVEMENTS.

..... SURFACE COURSE (OR PAVEMENT).

Insert name

Description.

Materials.

Construction methods.

Basis of payment.

Repeat the same outline for each kind of surfacing.

CONCRETE.

General description, classification, and statement of forms of construction in which each class of concrete is to be used.

Materials.

Specify composition and materials for each class.

Construction methods.

Basis of payment.

REINFORCEMENT.

Description.

Describe each kind in order with the methods for placing.

Basis of payment.

MASONRY.

..... MASONRY.

Insert name.

Description.

Materials.

Construction methods.

Basis of payment.

Repeat the same outline for each of the other kinds of masonry.

DRAINAGE STRUCTURES.

CONCRETE AND MASONRY CULVERTS, END WALLS, RETAINING WALLS, CATCH BASINS, DROP INLETS, ETC.

Statement that all concrete and masonry culverts, end walls for pipe culverts, retaining walls, catch basins, drop inlets, etc., shall be built of the class of concrete or kind of masonry indicated and according to the plans and specifications therefor.

Basis of payment.

PIPE CULVERT.

.....
Insert name.

Description.

Materials.

Construction methods.

Basis of payment.

Repeat the same outline for each kind of pipe culvert.

UNDERDRAINS.

..... UNDERDRAINS.

Insert name.

Description.

Materials.

Construction methods.

Basis of payment.

Repeat the same outline for each kind of underdrain.

GUTTERS.

Description.

Materials.

Construction methods.

Basis of payment.

Repeat the same outline for each kind of gutter.

CURBING.

Description.

Materials.

Construction methods.

Basis of payment.

Repeat the same outline for each kind of curb.

GUARDRAIL OR FENCING.

..... GUARDRAIL.

Insert name.

Description.

Materials.

Construction methods.

Basis of payment.

Repeat the same outline for each kind of railing or fencing.

MONUMENTS.

Description.

Materials.

Construction methods.

Basis of payment.

RIPRAP.

Description.

Materials.

Construction methods.

Basis of payment.

CRIBBING.

- Description.
- Materials.
- Construction methods.
- Basis of payment.

PILING.

- Description.
- Materials.
- Construction methods.
- Basis of payment.

STRUCTURAL STEEL AND IRON.

- Description.
- Materials.
- Fabrication.
- Construction methods.
- Basis of payment.

SURFACE TREATMENTS.

- Description.
- Materials.
- Methods of application.
Sweeping, applying, and covering.
- Basis of payment.

MISCELLANEOUS ITEMS.

..... ITEMS.
Insert name.

- Description.
- Materials.
- Construction methods.
- Basis of payment.
Repeat the same outline for each item desired.

MATERIAL DETAILS.

NOTE.—Should it be desired to group the specifications for all materials, they should be inserted at this place and appropriate references made thereto under the various subdivisions in “Construction details.” The materials should be grouped in classes and placed in the following order:

- Cementing materials.
Portland cement, lime, etc.
- Water.
- Fine aggregate.
Filler dust, sand, grit, etc., for all purposes.
- Coarse aggregate.
Stone, gravel, slag, etc., for all purposes.
- Telford and quarry stone, etc.

Masonry stone, etc.

Paving brick and blocks.

Bituminous materials.

Nonbituminous binders.

Culvert pipes, drain tiles, etc.

Cast iron, corrugated metal, concrete, vitrified clay, etc.

Metal reinforcement.

Bars, mesh, expanded metal, etc.

Structural steel.

Structural shapes, fabricated steel, etc.

Miscellaneous iron and steel.

Castings, special wrought work, etc.

Treated timbers.

Untreated timbers.

Paints, oils, etc.

Monuments.

Miscellaneous materials

Fencing wire, cables, pipe rail, etc.

SPECIAL PROVISIONS.

Supplementing the specifications for the construction of

Give the identification of proposed work, such as road name, number, job number, etc.

Under this heading should be placed such provisions or requirements as pertain to the particular contract proposed, and are not standard or common to all work for which the general specifications may have been prepared, such as:

Materials, etc., furnished by the State.

All materials, equipment, or other facilities for prosecuting the work, furnished by the State to the contractor, should be here listed, with conditions governing delivery, use, and return.

Statement relative to disposal of specific materials or structures found on the work and not to be used in the construction thereof.

NOTE.—Any “Special provisions” should be placed in this relative position, forming a part of the specifications. If the proposal is separated when bids are invited, then the special provisions may be bound with the specifications or with the proposal; but in either case a proper clause should be inserted in the proposal calling the attention of the bidder to the fact that there are certain “Special provisions” which form a part of the specifications.

PROPOSAL.

Spaces for name and address of bidder.

Detailed description of location of roadway, length and width of surfacing or pavement, referring to the plans, drawings, specifications, etc., by their titles and markings for identification.

NOTE.—If this proposal form is bound with the specifications and contract, it should be placed directly preceding the contract. If used as a separate form, the proposal may be attached to the contract, or a list of quantities with spaces for unit prices and amounts conforming to the outline indicated in the proposal may be shown in the contract as a part thereof, to be filled in at the time of its execution.

If the proposal bond form is used in place of the certified check, it should be attached to or furnished with the proposal form.

Address (as, "To the State Highway Department").

Declaration of the bidder that the only persons or parties interested in the proposal as principals are those named therein; that the proposal is made without collusion with any other person, firm, or corporation; that he has carefully examined the specifications, including special provisions, if any, and that he has made a personal examination of the site of the work; that he is to furnish all the necessary machinery, tools, apparatus, and other means of construction, and do all the work and furnish all the materials specified in the manner and time prescribed; that he understands that the quantities are approximate only and subject to increase or decrease, and the declaration of his willingness to perform any increased or decreased quantities of work at unit prices bid.

Itemized proposal showing the approximate quantities with spaces for unit prices bid, as:

Item 1: cu. yds. Excavation at (\$——) per cu. yd.

NOTE.—In case the above form is used, it may be used either with or without the quantities. If used without the quantities, the quantities should be listed under the "Special provisions."

OR

Item No.	Approximate quantities.	Items with unit bid price written in words.	Unit bid price.		Amount bid.	
			Dolls.	Cents.	Dolls.	Cents.
1	.....	Cu. yds. excavation for.....per cu. yd..	.....	.....	.....	.....
	Total.....	.....	.....	.....	.....	.....

NOTE.—Spaces should be left for filling in the unit prices both in words and figures, as indicated. The items of work should be numbered in the order and with the same units of measure shown in the specifications. The units of measure used should be as follows:

The cubic yard for all volumes except the gallon for bituminous materials when not weighed and the barrel for cement.

The square yard for all surface measurements except the square foot for wire mesh or expanded metal.

The foot for linear measurement.

The ton of 2,000 pounds for weights except the pound for steel and casting.

A unit price each for any item desired.

Proposal to perform "force account or extra work."

Proposal to execute contract agreement and to begin and complete work on time.

State dates or number of days for beginning and completion.

Proposal stating the amount of contract bond.

Proposal for guaranty of work until final completion and acceptance.

Statement of inclosure of proposal guaranty, naming amount, and conditions of forfeiture.

Note whether certified check or bond.

Spaces for signatures, titles, and individual addresses.

PROPOSAL BOND.

In case a proposal bond is used in lieu of a certified check, the form therefor should be attached to or furnished with the proposal form
(23)

CONTRACT.

The form of contract should be as short as consistent with legal requirements.

The "Notice to contractors," "Specifications," "Proposal," and "Plans" should be referred to and made a part of this agreement, and such reference should identify the specifications, plans, drawing, etc., by their specific markings.

The Federal Government is not to appear as party to this agreement.

CONTRACT BOND.

INDEX.

Itemized index to be placed at the end of the specifications instead of at this point if the foregoing documents are issued as separate pamphlets.

ESTIMATES.

Estimates shall be made up in accordance with the order and units of measure indicated in the proposal form.

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